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WHEEL, SAIL and WING

By MARY BOWEN STEPHENSON and LAWRENCE WOOD

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WHEEL, SAIL *and* WING

THE STORY OF TRANSPORTATION IN PICTURE STRIP

By

MARY BOWEN STEPHENSON
Author of The World of Animals

with drawings by

LAWRENCE WOOD

THOMAS S. ROCKWELL COMPANY
CHICAGO, 1930

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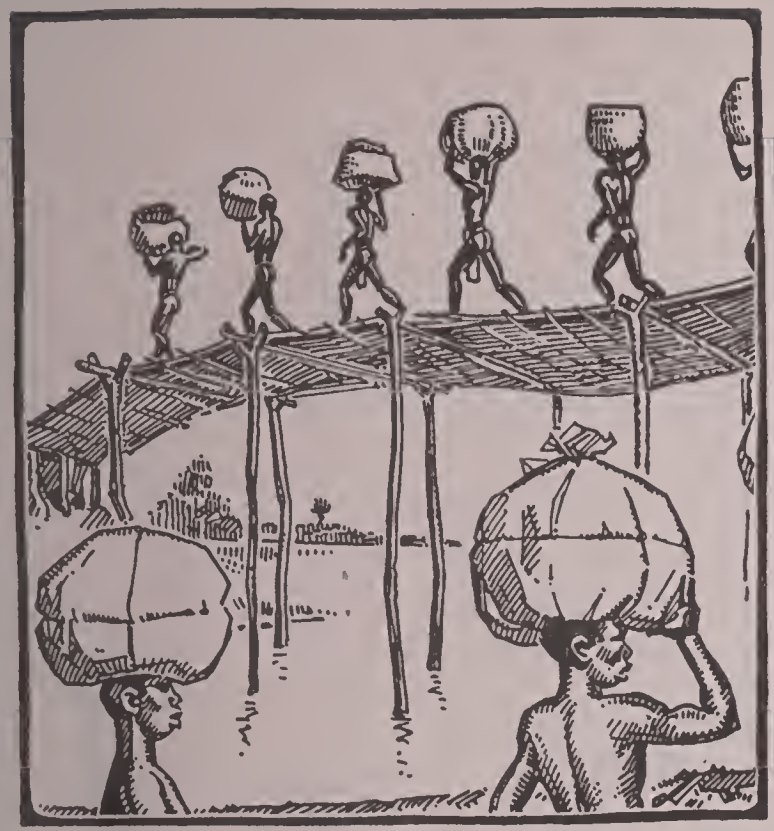
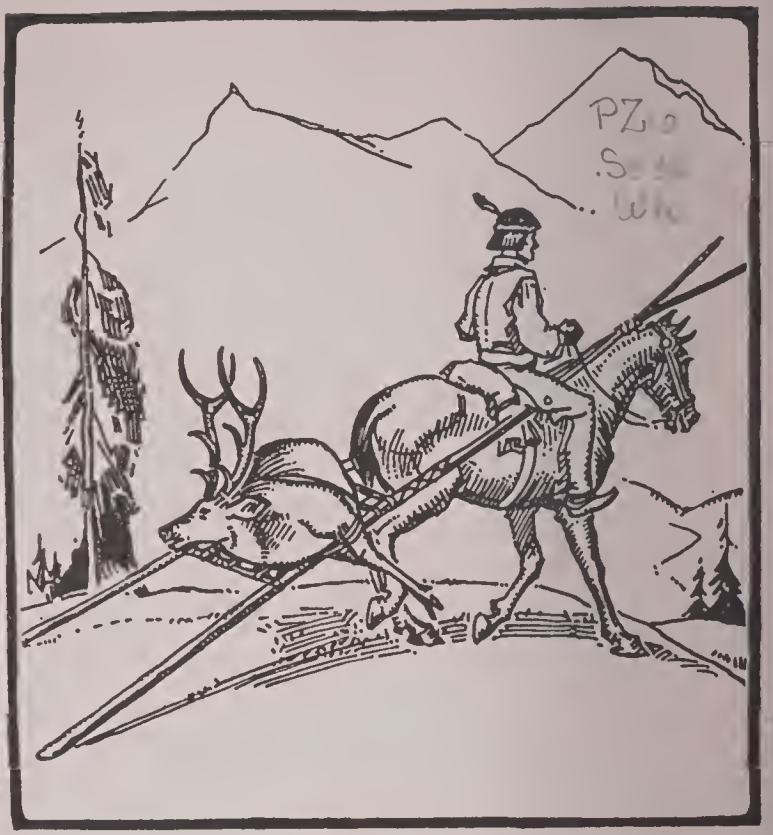




How Men First Moved

These men are carrying their belongings on their heads and walking, for they lived so long ago that they had not yet learned to tame horses for work.

We call this a pack train. This man has tamed horses and uses them to carry both himself and his belongings when he moves from place to place.

The Indians fastened deer that they had killed on two long poles which their ponies dragged over the ground. This sort of sled is called a traveau.

From Place to Place

The Eskimos and Indians, who live in the far North, built sleds with runners which their husky dog teams pulled easily over the snow.

This man is making the first wheels from the ends of a log. He found that it was much easier to pull things that roll than things that slide.

In early times when there were but few roads and bridges, men found it hard to cross rivers. These men and horses are crossing at a place called a ford.

How Men Traveled

Roman armies marched into the city over this famous road called the Appian Way. The Romans built the best roads in ancient times of stone slabs.

The Romans had many exciting races in these two-wheeled chariots, in which they rode standing up. They used them to carry them into battle, too.

Later, roads were so poor that rich people in the towns traveled in these closed chairs, called sedan chairs, fastened on poles and carried by two men.

on Two Wheels

In Japan horses are scarce and men work for only a few pennies a day, so people ride everywhere in carriages called jinrickshas, pulled by men.

Farmers used two-wheeled carts like this one during the centuries when the roads were rough, to carry their crops to the market in the near-by town.

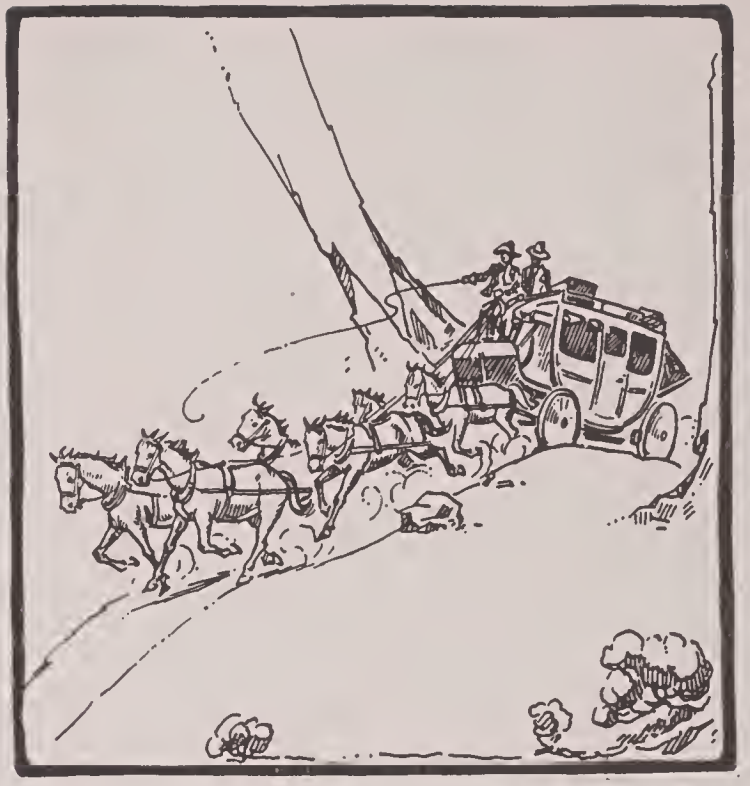
By the time of King Charles of England, who rode in this clumsy coach, men had learned that four wheels were much better than just two.

How People Traveled Long Distances

Roads made like this, of crushed stone, and called macadam after their Scotch inventor, were used for many years before the concrete road was invented.

Napoleon, the great French Emperor, rode many miles in this state coach. It is much lighter and more comfortable than any of the older coaches.

Whole families moved to California in these covered wagons when this country was young. Trains of them traveled together on the long journey.

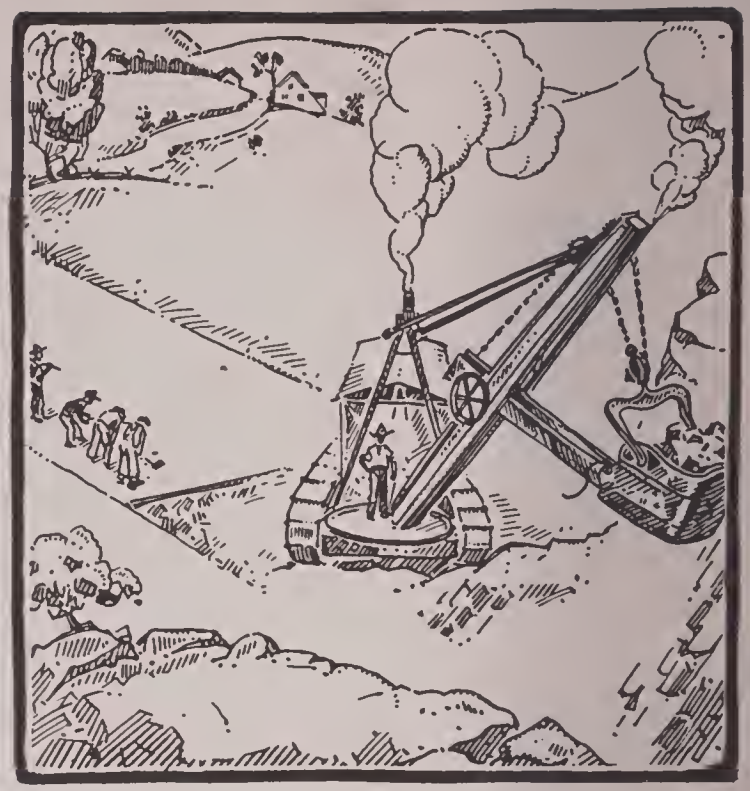


a Hundred Years Ago

The Pony Express carried the mail to the west. A man rode twenty miles or more, then handed the mail to another who waited on a fresh horse.

Stage coaches carried people who did not want to take everything they owned to the west. They changed drivers and horses along the way, too.

Light, open carriages like this one, called barouches, were used by fashionable people to drive about in the cities during the nineteenth century.

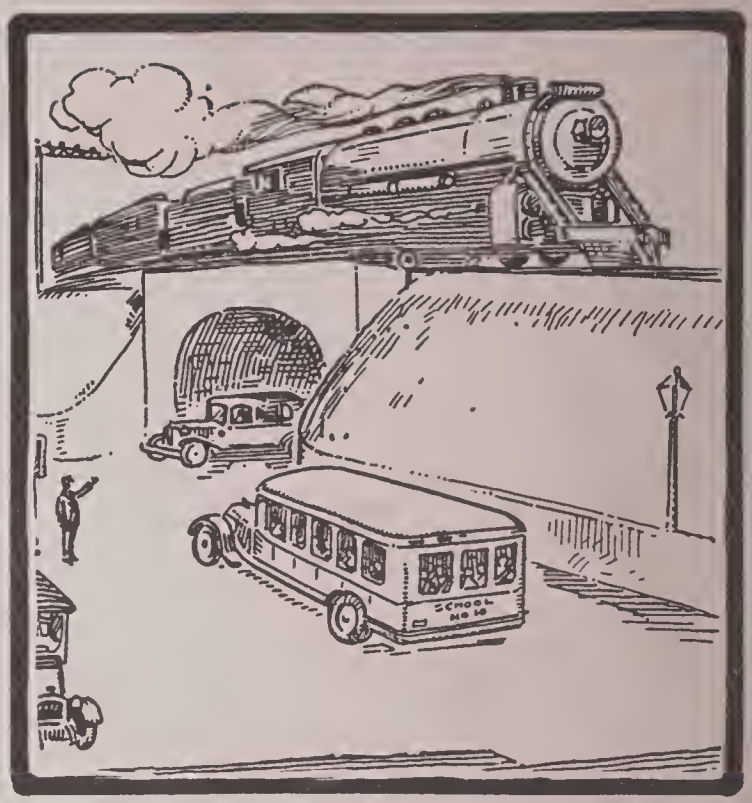


The Automobiles and Roads

Just before the automobile was invented, people rode everywhere on bicycles, which were quicker than walking and cheaper than using a horse.

This is one of the first automobiles invented. It went about ten miles an hour and people thought that it was dangerous because it frightened their horses.

These men are making one of the concrete roads we ride upon. They make it possible for us to go anywhere we wish in our automobiles.



# of Our Present Day

We can go thirty or forty miles in an hour in a big car like this, but people in the past, with horses and poor roads, could not go that far in two days.

Farmers now take their corn to the grain elevators in a truck which carries many times more than the old carts and wagons, and in much less time.

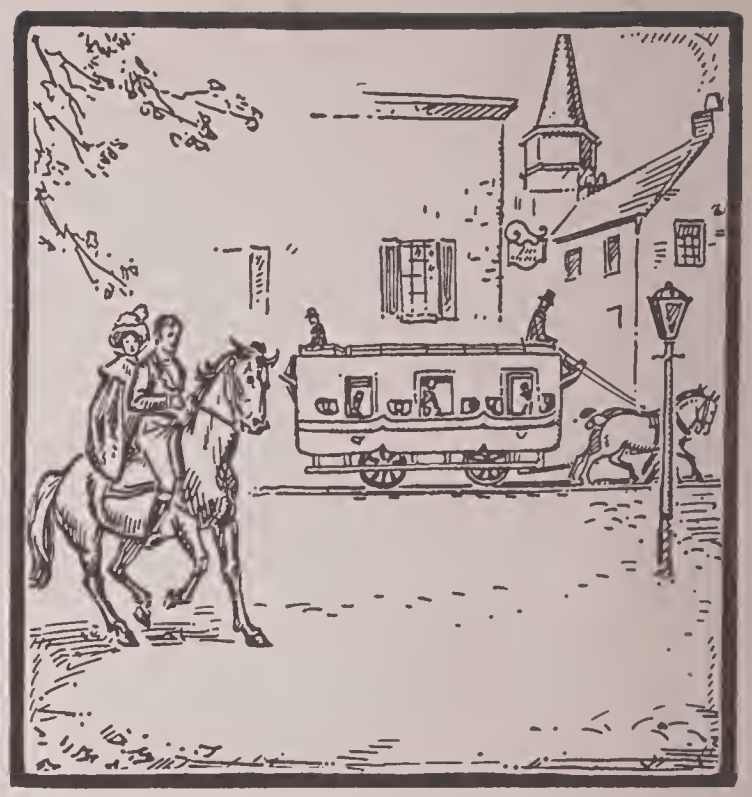
Now country children are called for and taken to school in a big bus that carries thirty or more, instead of having to walk several miles alone.

The First Wheels

People found that wheels rolled more easily on two rails, so the first railroad trains were large carriages that were pulled along the wooden tracks by horses.

The first trains ran on rails made of wood with strips of iron nailed on top. The strips often came unfastened at the ends and caused train wrecks.

A famous race was held between a train drawn by one of the first steam engines, the Tom Thumb, and a train drawn by a horse. The horse won.

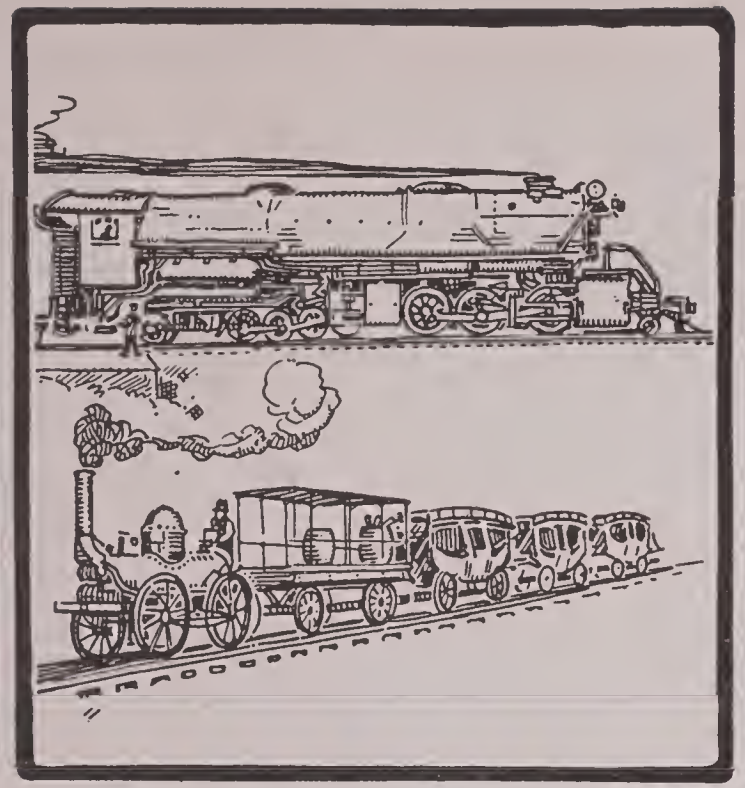


That Rolled on Rails

After Abraham Lincoln was killed, this train with the queer big smoke-stack carried his body back to his home in Springfield, Illinois, to be buried.

Railroad cars people used to ride in looked like this inside. They were heated by a stove in winter and the seats were quite hard and uncomfortable.

In the cities the street cars were drawn by horses or mules, until men learned how to use electricity to run them and invented the trolley car.



The Trains and Engines

The track our great trains run on is made of heavy steel rails fastened to wood ties and laid on carefully built-up ground so it will be firm enough.

The engines alone of our great trains are bigger than early trains like this one called the DeWitt Clinton, which ran from New York to Albany.

Engines that pull freight trains today are even larger and more powerful than the passenger engines for they have to pull long, heavy trains.

# of Our Present Time

We can even sleep on trains, in berths made by pulling two seats together and closing them off with green curtains. There are upper berths, too.

Street cars now are big and heavy and are run by electricity carried from wires overhead into the car's motor by the trolley. They carry fifty or more people.

In a test to find out which was the more powerful, a steam engine or an electric locomotive, each tried to pull the other. The electric engine easily won.

The Different Ways

When men first built bridges, they often hung them by vines from the branches of trees that extended over the streams they wished to cross.

In places where there was plenty of stone, people built arched bridges like this. Such bridges are very strong; many have lasted for hundreds of years.

This is the famous Brooklyn Bridge. It is called a suspension bridge because it hangs on great steel cables stretched between the towers at either end.

# of Crossing Rivers

The center part is about to be lifted into place on this bridge which crosses the St. Lawrence river at Quebec. This type of bridge is called a cantilever.

This bridge divides into two parts and lifts to let boats through. When it is down, it has two decks and crosses the Chicago river at Michigan Avenue.

Trains and automobiles are sometimes carried over bodies of water too large to be crossed by a bridge on big flat boats that are called ferries.

Boats That Sail

Men first traveled on water on rafts made by fastening several logs together, or in hollowed-out logs that made a rough canoe or dugout.

The earliest boats with sails looked like this one. They were used only on rivers at first for men were afraid of the ocean for a long time.

When roads in this country were few and bad, people sometimes moved all their belongings on flat boats that floated down the rivers.

on Rivers and Lakes

The Clermont, built by Robert Fulton, was one of the first boats to use a steam engine and paddle wheels at the side to move it instead of sails.

Boats like this, with a paddle wheel at the stern, were used on the Mississippi river to carry cotton and passengers from one city to another.

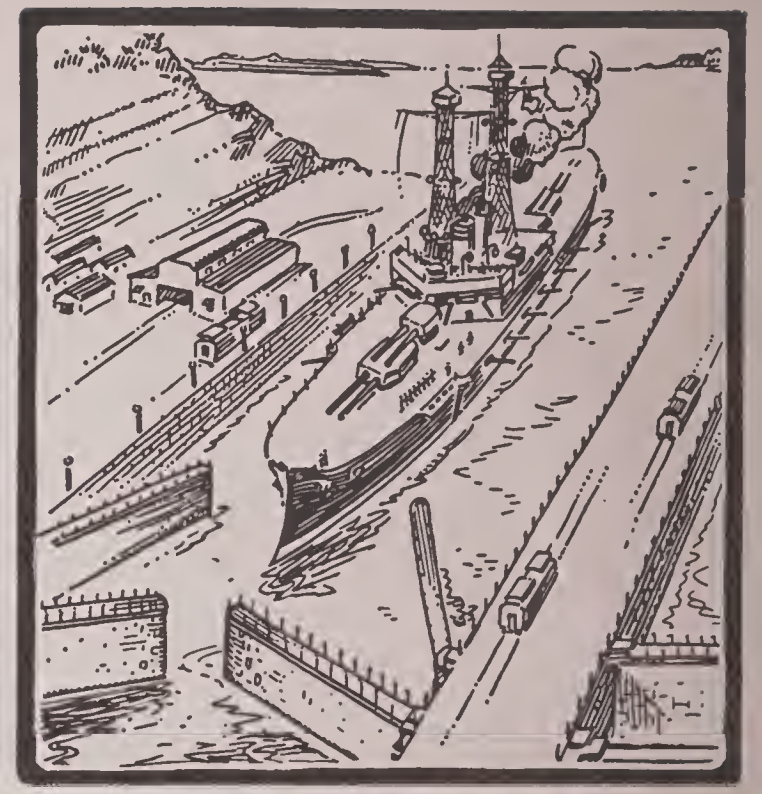
Coal and other freight is carried down the Mississippi river today on great fleets of barges fastened together and towed or pushed by one steamboat.

Ways of Getting Boats From

Before men learned to build canals from one stream to another, they had to carry their boats across the land between. They called it portage.

When they were building the Panama Canal, the land slid down many times at this place, called the Culebra Cut, which made the work hard.

When one lake is higher than another, the canal between them has to have locks to lift the boat from one level to the next. The early ones were like this.



One River or Lake to Another

On the old canals people traveled with all their belongings in flat boats drawn by a team of mules that walked along the bank of the canal.

Boats on inland canals today carry much freight. They are sometimes towed at sea by steamers or tugs which pull several barges at one time.

Through these great locks of the Panama Canal, battleships and ocean steamers are lifted or lowered on their way between the Pacific and Atlantic oceans.

Ships That Have Sailed

The Greeks built ships with three or four sets of oars, which were rowed by slaves. Sometimes they had sails on the ships, too, to help them.

In the Middle Ages the Venetian merchants sailed the Mediterranean Sea in galleys which were like the Greek ships only larger, with more sails and oars.

The Vikings sailed all over the ocean in these little boats. They even discovered America in one of them five hundred years before Columbus.

the Seas in All Ages

When Columbus discovered America, he crossed the ocean in this small ship named the Santa Maria. The voyage took him several months.

In the early days of our country ships like this, called schooners, carried men and freight across the ocean. It took many weeks to reach Europe.

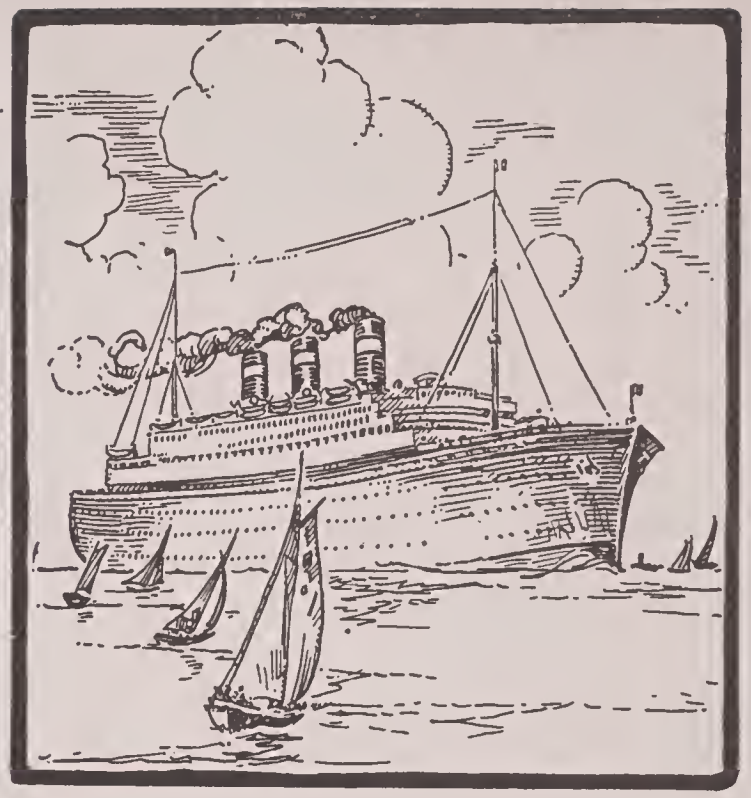
The fastest sailing ship ever built was called the Flying Cloud. She was a clipper ship and carried goods like tea from China to Boston and other ports.

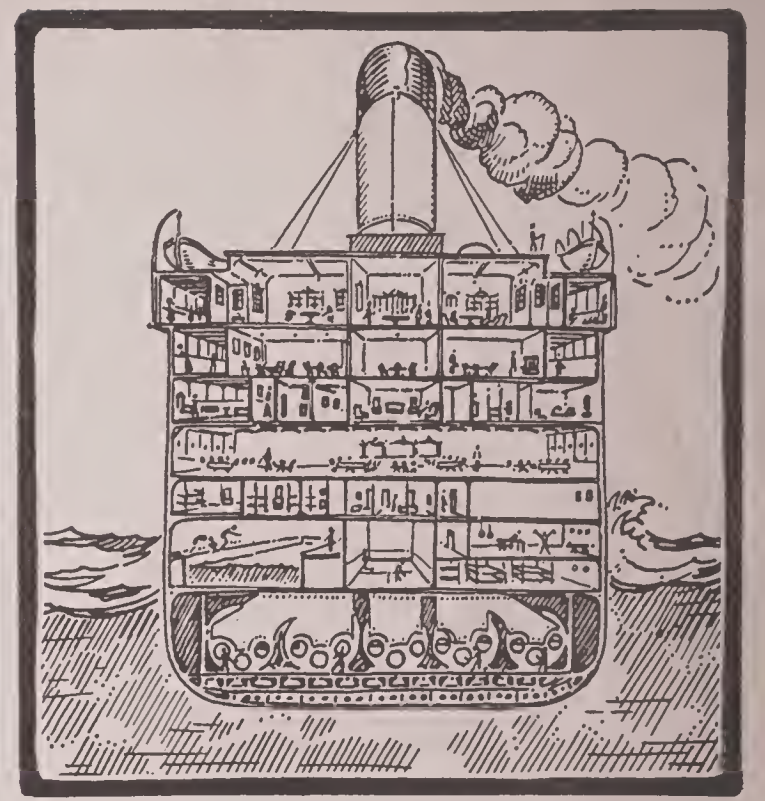
Ships That Use Steam

The Savannah was the first steamboat to cross the ocean. It had side paddle wheels and burned coal, and it also had sails which they used most of the time.

This is the Great Eastern, one of the first ships built of iron instead of wood, and moved by a screw propeller at the back. It also had side paddles.

This boat is being loaded with iron ore to be carried from the mines across the Great Lakes to the place where it will be made into cast iron or steel.



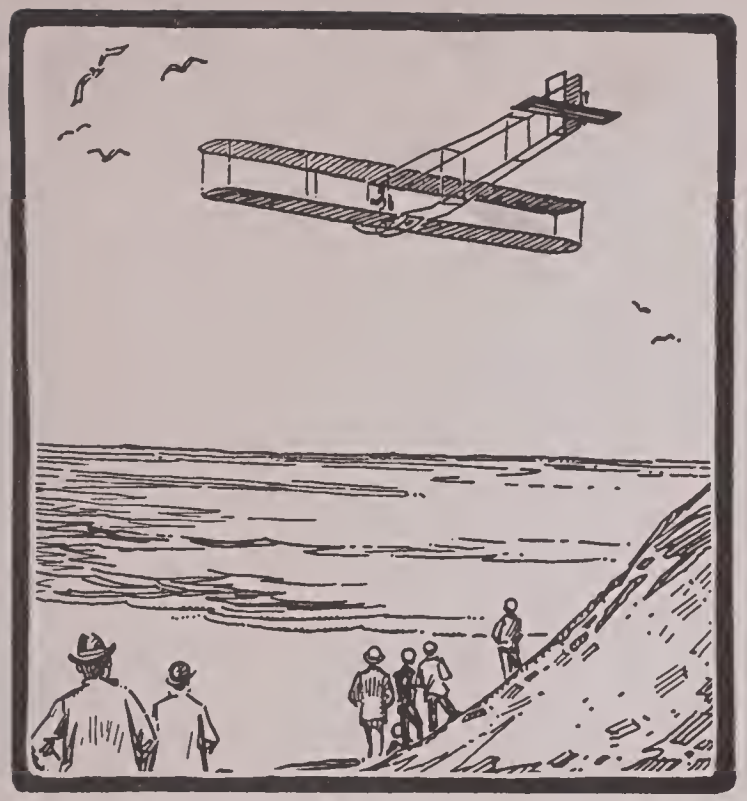


Instead of Sails

Crude oil from all parts of the world is brought across the ocean in ships like this called oil tankers. They are built for that special purpose.

This great steamship, the Leviathan, is more than a thousand feet long and carries several thousand people. It crosses the ocean in four or five days.

If you cut the Leviathan in half cross-ways, this is what it would look like. You can see how complicated it is and how it carries so many passengers.



Ships That Fly

Men first learned to fly in balloons filled with a gas that is lighter than air. They were like this one in which two men flew the English Channel.

About twenty-five years ago, two brothers named Wright learned to fly a machine that was heavier than air. It was the first successful airplane.

During the Great War airplanes like this were used a great deal to spy out the enemy and to drop bombs where they would do the most damage.

in the Air on Wings

The first flight across the Atlantic Ocean from New York to Paris, alone, was made by Lindbergh in a monoplane, called the Spirit of St. Louis.

The Graf Zeppelin flew around the world in twelve days flying time, which is much faster than any one used to dream it could be done.

The Dox is the largest airplane that has ever been built. It is a German sea plane with twelve motors and will carry over one hundred people.

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